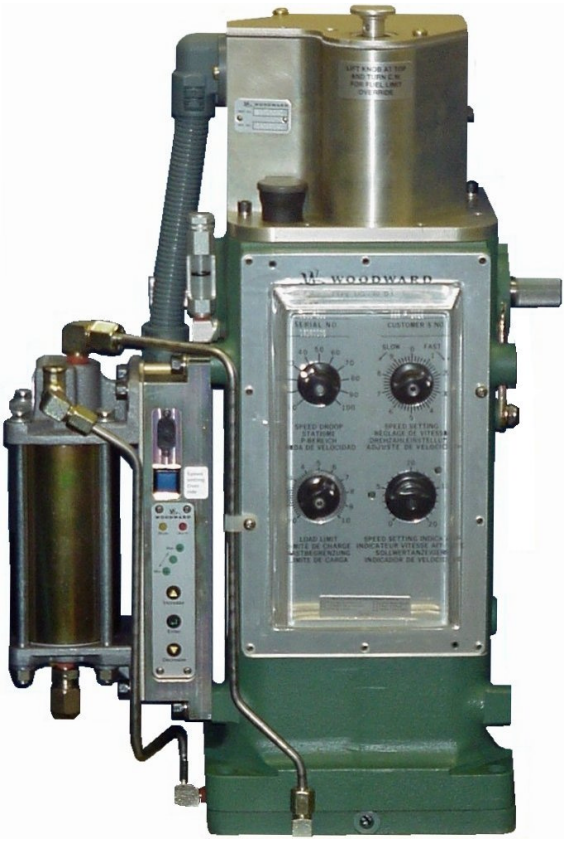
UG40-DI

UG40 with Digital Interface



- Proven reliabilty of the Woodward UG governor family
- Fully configurable for engine type
- For both propulsion and generator applications
- Remote speed setting
- Alarm and diagnostic indications
- Adjustable start-fuel limiter
- Integrated booster
- Integrated running hours counter

APPLICATIONS

The UG40-DI is a mechanical-hydraulic dial governor with a digital interface. The UG40-DI has all the features of the traditional UG40 governor, but with a digital interface for remote speed setting, start fuel limiting and shutdown. Its proven and reliable hardware in combination with adjustable software settings ensure versatility and system integration. The UG40-DI has extensive alarm and diagnostics features that monitor the condition of the governor functions. Whenever necessary, the digital interface settings can be overruled by the manual settings.

UG40-DI governors are used in speed or load control applications for larger dual fuel, diesel or gas engines or steam turbines with governor drive speeds of 350 to 1300 rpm.

The UG40-DI is primarily used for propulsion/power-generation applications.

GOVERNOR MECHANICAL SPECIFICATIONS

Installation and construction
The UG40-DI is designed for vertical operation, but can be tilted up to 45º from vertical. The case and base of the UG40-DI are cast iron. Interior parts are made of stainless steel, steel and case-hardened steel as necessary to provide a durable and reliable construction. The cover and digital interface are made of aluminum. The terminal shaft (output shaft) may be on the right or left side, or on both sides. The position is the same as for the standard UG40 governor.

Governor drive
The UG40-DI can be driven in both directions, allowing use with direct reversing engines.

Hydraulic system
The UG40-DI has an internal oil pump, driven from the governor drive shaft. A relief-valve accumulator maintains oil pressure with a drain to an internal sump.

Dashpot pressure compensation provides governor stability. Droop is available to permit load-sharing. A needle valve is used to provide optimum adjustment to exactly match the governor with a particular engine's dynamics.

Droop and compensation
All droop percentages are based on total speed change between no load and full load over 38º of terminal shaft rotation. Actual droop is lower because full travel is not recommended. Droop is adjustable from 0 to 14% at 1000 RPM and from 0 to 17.5% at 800 RPM.

Exterior adjustment is possible while the governor is controlling engine operation. The adjustment determines the amount of offspeed which occurs with load changes. An effective needle valve opening of up to 3 turns is made in conjunction with compensation adjustment. Adjustment of the needle valve determines the duration of offspeeds, which occurs with load changes.

Optional mechanical features
A booster servomotor can be used to supply pressure oil to the governor when starting air is supplied to the engine during quick engine starts, thus conserving engine starting air.

Special solid or spring-driven vibration-damping ball-head assemblies can help match the UG40-DI to a particular engine. Pilot valve bushing can have special "chopper" porting for slow response in acceleration (normal porting is either 2-slotted or 8-round). Contact Woodward determibe an exact match between the bushing and ball head and the engine.

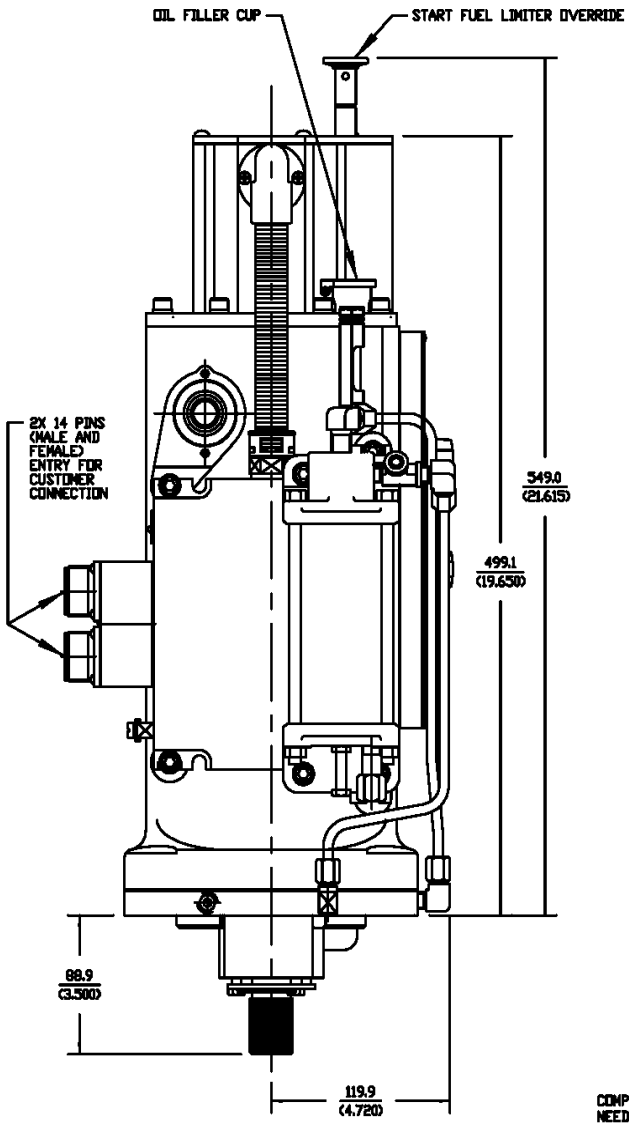
Reduced compensation is available when the compensation on a standard governor is too large for the characteristics of the engine.

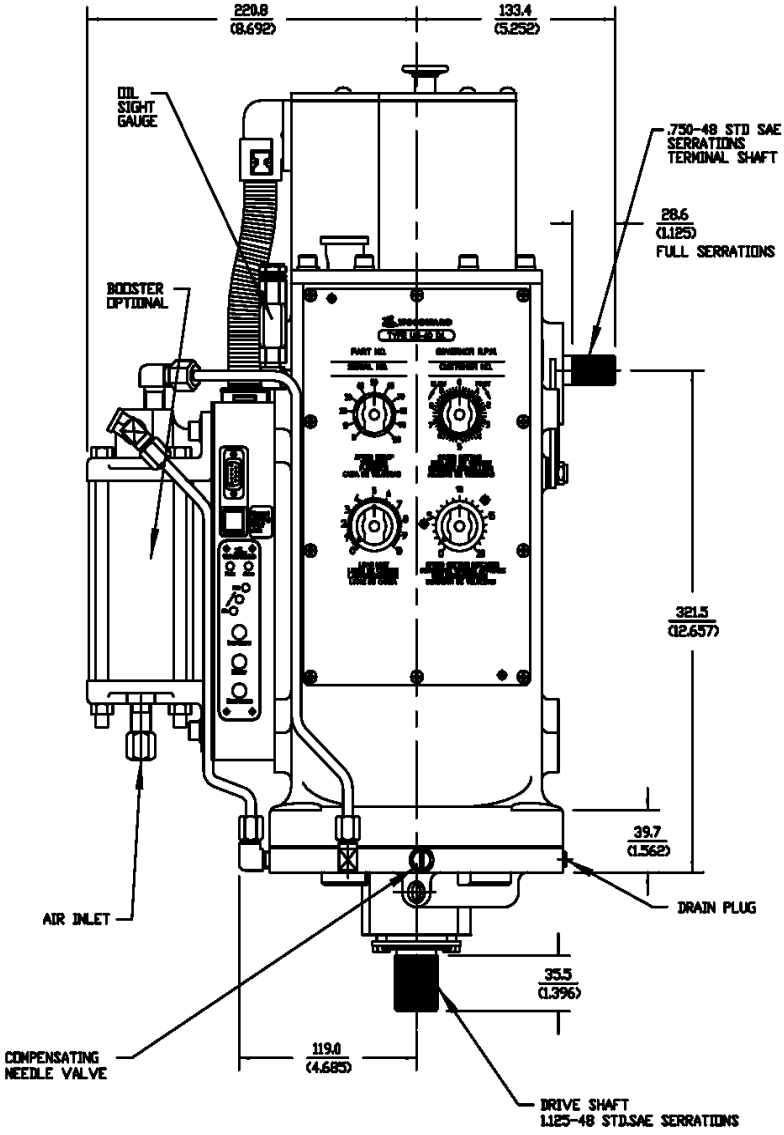
DIGITAL INTERFACE SPECIFICATIONS

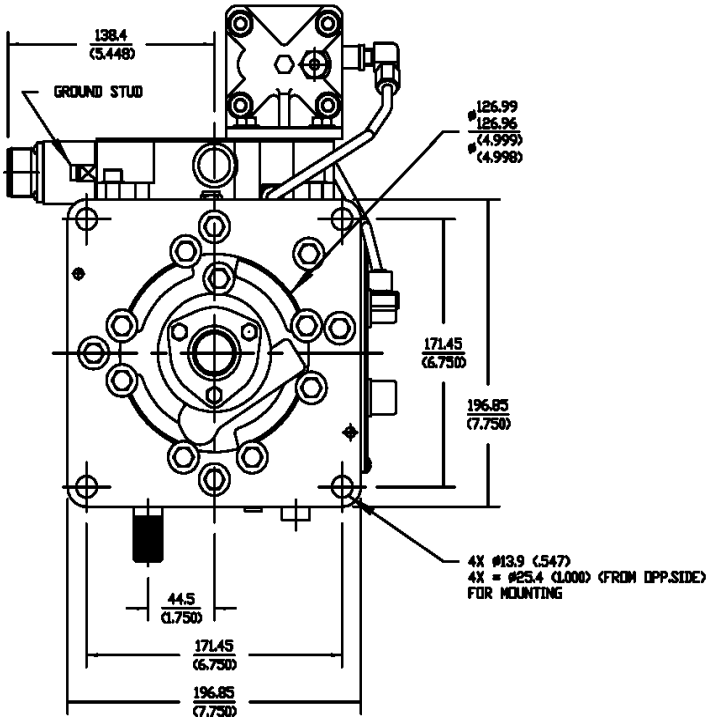
Speed setting
Remote speed setting is standard. The UG40-DI offers four ways to set the speed (in order of priority): fixed speed setting, raise and lower and 4-20mA. Speed setting is controlled by a feedback sensor with absolute indication so that speed setting is not lost if a power loss occurs. The speed-setting module cannot be used to control engine speed in a closed loop system.

Shutdown
An engine shutdown solenoid is optional (energized and de-energized versions are available). The shutdown function is independent of other UG40-DI functions and is capable of shutting down the engine with the control signal only, even if the digital interface is not powered.

Start fuel limiting
Start fuel limiting is optional. Two potential-free switches and one analog input control the start fuel limiter. The shutdown signal is used to pilot the start fuel limiter. The limits are pre-adjustable to a value between 0% to 100% of the terminal shaft position by programing the digital interface.







METRIC

NOTE: INCHES SHOWN IN PARENTHESES

ALL DIMENSIONS FOR REFERENCE ONLY.

Please refer to the revision-controlled outline drawing available from Woodward for exact governor dimensions and mounting patterns.

WOODWARD

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Alarm and diagnostics

Alarm and diagnostics functions monitor the internal electronics of the digital interface as well as the electrical inputs and outputs. An alarm indication is provided on the user interface of the UG40-DI. There is a solid-state alarm relay which can be wired to the end-user's monitoring and control systems.

Wiring

Two round 14-pin Bendix receptacles on the UG40-DI are used to connect end-user wiring. Woodward advises use of 24 AWG PTFE insulated wiring or better in the mating connectors.

Serial Communication

The UG40-DI serial port can be connected to a PC, permitting servicing and updated of the digital interface (used by Woodward or trained personnel only). An end-user can monitor actual digital interface parameters and settings using this connection.

SPECIFICATIONS

Speed range	350 - 1050 rpm (low speed), 550 - 1300 rpm (high speed)
Work capacity	78 J (57.5 ft-lb)
Drive power requirement	0.37 kW (0.5 hp)
Output	38º
Oil capacity	7 liters
Start Fuel Limit Duration	Adjustable from 0-20 sec
Governor pressure	1724 kPa (250 psi)
Weight	Approx. 50 kg (110 lbs)
Operating Temperature Range	-20 to 93°C (-4 to 200°F)
Storage Temperature Range	-40 to 100°C (-40 to 212°F)
Vibration Qualification Test Specification	Woodward RV2 (0.1 G2/Hz Random, 10-2000 Hz, 12.8 Grms, 3 hr per axis).
Shock Qualification Test Specification	40 G, 11 msec saw-tooth pulse
Humidity Qualification Test Specification	Woodward H2 (60°C, 95% RH, 5 days)
IP level	IP54
Steady state speed band	0.25 % of rated speed (under normal operating conditions)
Speed setting linearity	1 % over full range
Speed setting bandwidth	0.5 Hz for full range step (4 to 20mA and 20 to 4mA)
Power supply	24 Vdc nominal (18 - 32 Vdc), 25 watts (fused by 3A, slow)
Shutdown power	18 - 31 Vdc, 12 watts
Alarm signal output	17-31 Vdc, 100 mA, sourcing only
Standard governer drive shaft	1.125" diameter shaft with 48 SAE serrations
Optional governer drive shaft	0.625" diameter shaft with keyway 0.187" wide x 0.094" deep x 1.500" long for gear held by 0.625"-18 castle nut
Terminal (output) shaft	0.750" diameter with 48 SAE serrations

For more information contact: